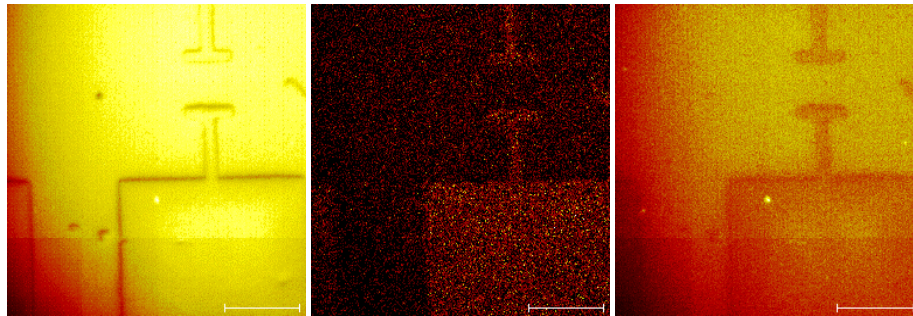


TRIFTIII Time-Of-Flight Secondary Ion Mass Spectrometer

Joseph W. Lyding & Jinju Lee, University of Illinois at Urbana-Champaign

DMR 0216102

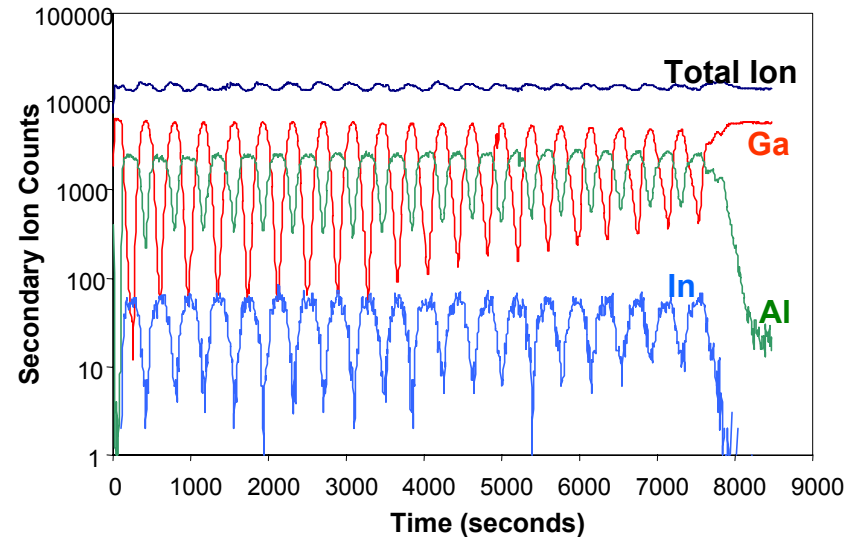


Total ion

P - doped

Si

Above: Chemical imaging of processed wafer (Courtesy Keith Hurley, Nuzzo research group). **Right:** Superlattice depth profile with high depth resolution (Courtesy Chaofeng Xu, Hsieh research group)



In 15 months of operation...

33 users total: 4 professors, 8 post-docs, 21 grad students

5 off-campus users from academia, national labs, & industry

28 University of Illinois research groups / 9 academic departments

5 journal and conference papers in preparation

TRIFTIII Time-Of-Flight Secondary Ion Mass Spectrometer

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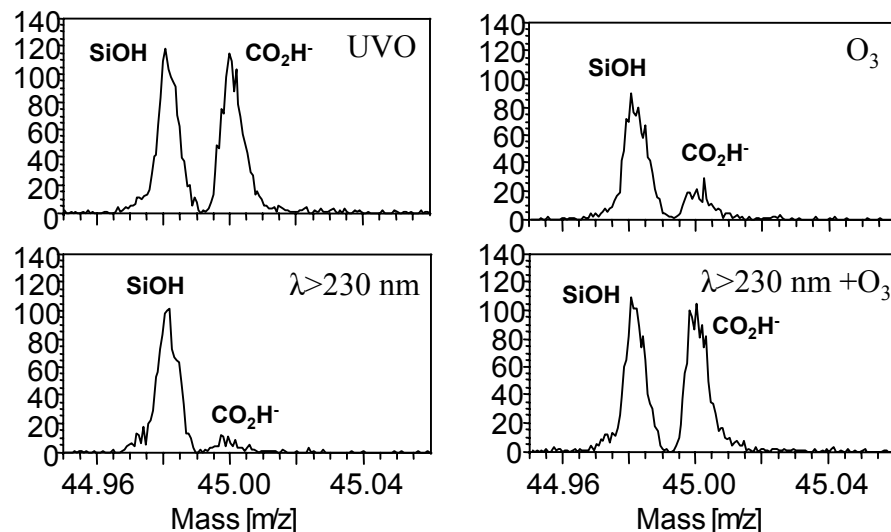
Analysis of Ultraviolet-Ozone (UVO) Modified Poly(dimethylsiloxanes) (PDMS) by TOF-SIMS

Discovered a correlation between adhesion properties of UVO modified PDMS and the presence of CO_2H^- ion on PDMS surface.

Proved UVO mechanism (not UV or ozone separately) is responsible for the adhesion of PDMS to surfaces and correlates to the formation of the CO_2H^- ion as shown below.

Demonstrated the sub-micron edge resolution of UVO patterning.

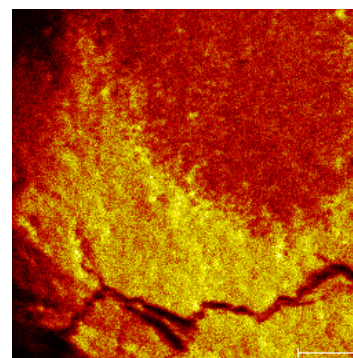
Established that fluorinated silanes selectively adsorb to areas of the PDMS surface where CO_2H^- ions are observed.



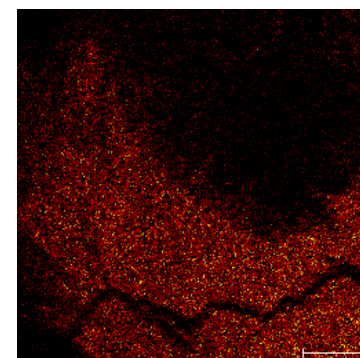
Courtesy William Childs, Nuzzo research group

TOF-SIMS Ion Image of Spinal Cord Slice

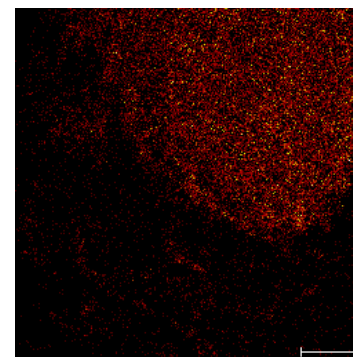
Images below show choline and cholesterol variations across a section of spinal cord. Work to identify and image neurotransmitters within neurons is progressing rapidly.



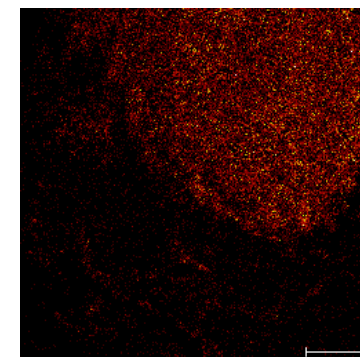
Total ion



Choline



Cholesterol (-OH)



Total Cholesterol

Courtesy Eric Monroe, Sweedler research group